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martha-j.martin@cibavision.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FIONA CARNEY, MANAL GABRIEL,
CAROL MORRIS, and JOHN LALLY

Appeal 2009-010389
Application 10/722,256
Technology Center 1600

Decided: April 12, 2010

Before TONI R. SCHEINER, RICHARD M. LEBOVITZ, and
STEPHEN WALSH, *Administrative Patent Judges*.

WALSH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) involving claims to a contact lens. The Patent Examiner rejected the claims on the ground of obviousness. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

STATEMENT OF THE CASE

Claims 1-5, 16 and 17, which are all the pending claims, are on appeal. Claim 1 is representative and reads as follows:

1. A contact lens comprising a core material which is a silicone-containing hydrogel material and an antimicrobial LbL coating that is not covalently attached to the core material, wherein the antimicrobial LbL coating includes:
 - (a) a polyelectrolyte LbL coating and an [sic] peptide layer of one or more antimicrobial peptides, wherein the polyelectrolyte LbL coating is composed of
 - (i) at least one layer of a first polyionic material, or
 - (ii) at least one layer of the first polyionic material and at least one layer of a second polyionic material having charges opposite of the charges of the first polyionic material,wherein said first and second polyionic materials, independently of each other, have functional groups which provide reactive sites, and wherein the peptide layer of one or more antimicrobial peptides are covalently attached to the LbL coating through the reactive sites, wherein the antimicrobial LbL coating imparts to the core material an increased surface hydrophilicity.

The Examiner rejected the claims as follows:

- claim 1 under 35 U.S.C. § 103(a) as unpatentable over Winterton¹ and Sakuma;²
- claim 1 under 35 U.S.C. § 103(a) as unpatentable over Winterton, Sakuma and Okrongly;³ and
- claims 2 and 3 under 35 U.S.C. § 103(a) as unpatentable over Winterton, Sakuma and Diaz-Achirica;⁴ and

¹ US 2001/0045676 A1, by Lynn Cook Winterton et al., published Nov. 29, 2001.

² US 5,213,801, issued to Shuji Sakuma et al., May 25, 1993.

³ US 4,933,410, issued to David Okrongly, Jun. 12, 1990.

- claims 2, 4, 5, 16 and 17 under 35 U.S.C. § 103(a) as unpatentable over Winterton, Sakuma and Diaz-Achirica.

OBVIOUSNESS

The Issues

The Examiner's positions are:

- (1) "[t]he combination of Winterton and Sakuma teach the claimed invention in regard to 1(b)" (Ans. 4);
- (2) given Okrongly's teaching to attach biologically active proteins and peptides to polystyrene, it would have been obvious to covalently bond antimicrobial peptides to the LbL polyionic bilayer suggested by Winterton and Sakuma (*id.* at 5); and
- (3) given Diaz-Achirica's disclosure of the antimicrobial cecropin A melittin hybrid peptide, it would have been obvious "to use the cecropin A melitin [sic] hybrid as the antimicrobial peptide of Winterton" in the lens suggested by Winterton and Sakuma (*id.* at 6).

Appellants contend that the references did not "disclose or suggest all of the elements of the invention as currently claimed." (App. Br. 4.) More specifically, Appellants argue that neither Winterton nor Sakuma disclosed or suggested covalently attached antimicrobial peptides. (*Id.*)

Appellants contend that Okrongly's "polystyrene is not a polyionic material," and disagree with the Examiner's finding that Okrongly taught "the principle of functionalizing the surface for attachment of various

⁴ Pilar Diaz-Achirica et al., *Permeabilization of the mitochondrial inner membrane by short cecropin-A-melittin hybrid peptides*, 224 EUR. J. BIOCHEM. 257-263 (1994).

proteins[, which] principle will be the same whether the protein is attached to polystyrene or any material.” (*Id.*) Appellants argue that “protein attaching to functionalized polystyrene does not satisfy [claim 1’s] requirement of ‘said first and second polyionic materials, independently of each other, have functional groups which provide reactive sites.’” (*Id.*)

The issues with respect to these rejections are:

did the combined teachings of Winterton and Sakuma teach or suggest all the limitations of claim 1;

were the combined teachings of Winterton, Sakuma and Okrongly sufficient to show that claim 1 would have been obvious; and

did the combined teachings of Winterton, Sakuma and Diaz-Achirica teach or suggest all the limitations of claims 2-5, 16 and 17?

Findings of Fact

1. Winterton disclosed “an improved method of treating a contact lens to alter surface properties.” (Winterton, 2: [0011].)
2. Winterton disclosed “coating a mold with polyionic materials, such as polyanionic and polycationic materials.” (*Id.* at 2: [0012].)
3. Winterton disclosed that “[i]n addition to polyionic materials, various other materials and/or additives can be applied to a mold of the present invention before forming a contact lens therein. Some examples of suitable additives include . . . antimicrobials, antibacterials” (*Id.* at 2: [0019].)
4. Okrongly’s disclosure concerned “functionalizing polystyrene surfaces, particularly labware, for covalent conjugation of molecules.” (Okrongly, col. 1, ll. 8-10).

5. Okrongly taught using hydroxymethyl amides to functionalize the phenyl groups on polystyrene. (*Id.* at col. 2, ll. 3-6.)
6. Okrongly's functionalized polystyrene had substitutable functionalities permitting nucleophilic substitution. (*Id.* at col. 2, ll. 6-9.)
7. After being functionalized, Okrongly's activated polystyrene surface could be reacted with compounds capable of substituting for the substitutable groups. (*Id.* at col. 4, ll. 54-56.)

Principles of Law

Obviousness is a question of law based on fact findings. The scope and content of the prior art are determined; differences between the prior art and the claims at issue are ascertained; the level of skill in the art is resolved; and objective record evidence of nonobviousness is considered. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). When determining whether a claim is obvious, an Examiner must make "a searching comparison of the claimed invention – including all its limitations – with the teaching of the prior art." *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995).

Analysis

Claim 1 defines a contact lens in which "the peptide layer of one or more antimicrobial peptides are covalently attached to the LbL coating through the reactive sites." We agree with Appellants that rejection "1)" over Winterton and Sakuma (Ans. 3-4), rejection "3)" over Winterton, Sakuma and Diaz-Achirica (Ans. 5-6), and rejection "4)" over Winterton,

Sakum and Diaz-Achirica (Ans. 6), did not account for that claim limitation. The Examiner has not pointed to evidence that Winterton, Sakuma or Diaz-Achirica, taught or suggested covalently attached antimicrobial peptides in a contact lens. Because rejections “1),” “3),” and “4)” did not account for that claim limitation, we cannot affirm them.

We agree with Appellants that Okrongly’s polystyrene is not a polyionic material, and it is not converted to a polyionic material by the functionalization that readies it for covalent attachment with peptides. The Examiner treated the issue as strictly a question of “motivation,” i.e., the desirability of preventing peptides from being washed away. (Ans. 7.) The problem with that line of reasoning is that it assumes that Okrongly’s polystyrene labware is sufficiently like a contact lens that a person working in the contact lens art could take Okrongly’s disclosure, along with Winterton and Sakuma, and be put in possession of Appellants’ invention. We cannot agree that the general idea of covalent attachment is sufficient to bridge the gap between the prior art of record and the claimed invention.

CONCLUSIONS OF LAW

The combined teachings of Winterton and Sakuma did not teach or suggest covalent attachment of peptides to a polyionic material and therefore did not teach or suggest all the limitations of claim 1.

Diaz-Achirica did not supply the disclosure missing from Winterton and Sakuma, and the combined teachings of Winterton, Sakuma and Diaz-Achirica therefore did not teach or suggest all the limitations of claims 2-5, 16 and 17.

The combined teachings of Winterton, Sakuma and Okrongly were not sufficient to show that claim 1 would have been obvious.

SUMMARY

We reverse the rejection of claim 1 under 35 U.S.C. § 103(a) as unpatentable over Winterton and Sakuma.

We reverse the rejection of claim 1 under 35 U.S.C. § 103(a) as unpatentable over Winterton, Sakuma and Okrongly.

We reverse the rejection of claims 2 and 3 under 35 U.S.C. § 103(a) as unpatentable over Winterton, Sakuma and Diaz-Achirica.

We reverse the rejection of claims 2, 4, 5, 16 and 17 under 35 U.S.C. § 103(a) as unpatentable over Winterton, Sakuma and Diaz-Achirica.

REVERSED

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